## What is claimed is:

- 1. An electronically conducting fuel cell component comprising:
- a) a porous metal flow field;
- b) an intermediate layer bonded directly to the porous metal flow field; and
  - c) an electrode bonded directly to the intermediate layer.
- 2. The fuel cell component of claim 1, wherein the porous flow field comprises a three-dimensional reticulated metal structure.

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3. The fuel cell component of claim 2, wherein the three-dimensional reticulated structure comprises porous copper, porous nickel, porous aluminum, porous titanium, or a porous aluminum-titanium alloy.

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4. The fuel cell component of claim 3, wherein the three-dimensional reticulated structure comprises porous nickel.

- 5. The fuel cell component of claim 1, wherein the porous metal flow-field further comprises a protecting layer disposed on at least one surface thereof.
- 6. The fuel cell component of claim 5, wherein the protecting layer comprises a metal or a metal oxide.
- 7. The fuel cell component of claim 6, wherein the protecting layer comprises tin, copper, nickel, aluminum, titanium, or gold.
  - 8. The fuel cell component of claim 6, wherein the protecting layer comprises ruthenium oxide, titanium oxide, or tin oxide.

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- 9. The fuel cell component of claim 8, wherein the protecting layer comprises tin oxide.
- 5 10. The fuel cell component of claim 9, wherein the tin oxide layer is between about 1 and about 5  $\mu$ m thick.
  - 11. The fuel cell component of claim 10, wherein the tin oxide layer is between about 1 and about 2  $\mu m$  thick.
  - 12. The fuel cell component of claim 1, wherein the intermediate layer comprises a polymer and high surface area carbon particles.
  - 13. The fuel cell component of claim 12, wherein the polymer comprises polytetrafluoroethylene, perfluoroethylene-perfluoropropylene copolymer, perfluoroalkoxy, or polyvanilidene fluoride.
  - 14. The fuel cell component of claim 1, wherein the electrode comprises a polymer electrolyte and an electrocatalyst.
  - 15. A method for making an electronically conducting fuel cell component comprising the steps of:
  - a) directly bonding an electrically conducting intermediate layer to a porous flow field; and
- b) directly bonding an electrode to the intermediate layer.

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- 16. The method of claim 16, wherein the porous flow field comprises a threedimensional reticulated metal structure.
- 17. The method of claim 16, wherein the three-dimensional reticulated structure comprises porous copper, porous nickel, porous aluminum, porous titanium, or a porous aluminum-titanium alloy.
  - 18. The method of claim 17, wherein the three-dimensional reticulated structure comprises porous nickel.
  - 19. The method of claim 16, wherein the porous metal flow-field further comprises a protecting layer disposed on at least one surface thereof.
  - 20. The method of claim 19, wherein the protecting layer comprises a metal or a metal oxide.
    - 21. The method of claim 20, wherein the protecting layer comprises tin, copper, nickel, aluminum, titanium, or gold.
- 20 22. The method of claim 20, wherein the protecting layer comprises ruthenium oxide, titanium oxide, or tin oxide.
  - 23. The method of claim 22, wherein the protecting layer comprises tin oxide.
- 25 24. The method of claim 23, wherein the tin oxide layer is between about 1 and about 5  $\mu$ m thick.

- 25. The method of claim 24, wherein the tin oxide layer is between about 1 and about 2  $\mu m$  thick.
- 26. The method of claim 16, wherein the intermediate layer comprises a polymer and high surface area carbon particles.
  - 27. The method of claim 26, wherein the polymer comprises polytetrafluoroethylene, perfluoroethylene-perfluoropropylene copolymer, perfluoroalkoxy, or polyvanilidene fluoride.

28. The method of claim 16, wherein the electrode comprises a polymer electrolyte and an electrocatalyst.

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